

HT32 ICP Tool

User Manual

The information described in this document is the exclusive intellectual property of Holtek Semiconductor and shall not be reproduced without permission from Holtek.

Holtek is providing this document only for reference purposes of HT32 MCU based system design.

Holtek assumes no responsibility for errors or omissions.

All data and specifications are subject to change without notice.

For additional information or questions, please contact: Holtek Semiconductor.

Table of Contents

1.	Overview	3
1.1.	Introduction	3
1.2.	Features	3
2.	Operation Modes of ICP Tool.....	3
2.1.	Online Programming Mode.....	3
2.2.	Offline Programming Mode.....	4
3.	How to Use ICP Programming Tool.....	4
4.	e-Link32 Firmware Update	7

1. Overview

1.1. Introduction

“ICP” is the acronym of In-Circuit Programming, which makes it possible that the user can update the MCU’s program memory under the software control without removing the mounted MCU chip from target PCB.

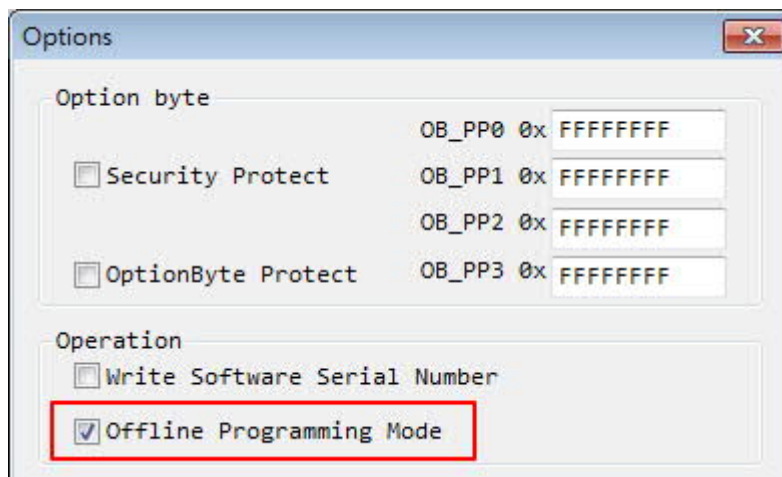
The HT32 ICP Programming Tool supports “online” and “offline” programming mode.

1.2. Features

- In-Circuit programming target chip
- Online/offline programming mode
- Write software serials number (SN) to target chip
- Limit the maximum programming count
- Data encryption for online/offline programming

2. Operation Modes of ICP Tool

The ICP tool supports “online” and “offline” programming mode.



2.1. Online Programming Mode

If the “Offline programming mode” option is unchecked, ICP Tool will program in online programming mode.

Click the “Start” button to start to program target device immediately.

The target device must be connected to e-Link32.

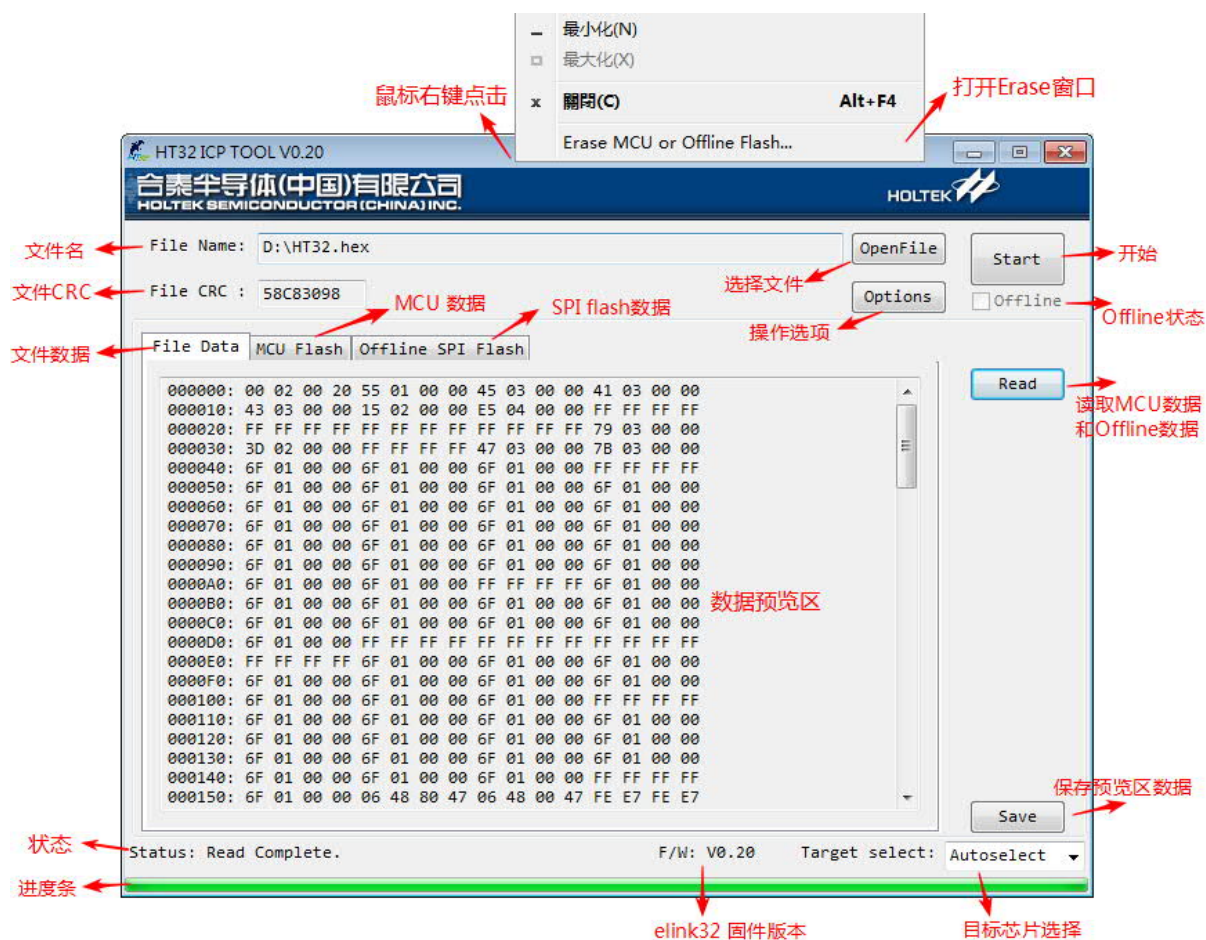
2.2. Offline Programming Mode

If the “Offline programming mode” option is checked, the ICP Tool will program in offline programming mode. Click the “Start” button to save the file data into e-Link32 at first,

Next, user can program the target devices with the eLink32 alone (instead of using PC and ICP Tool) by pressing the button on the e-Link32.

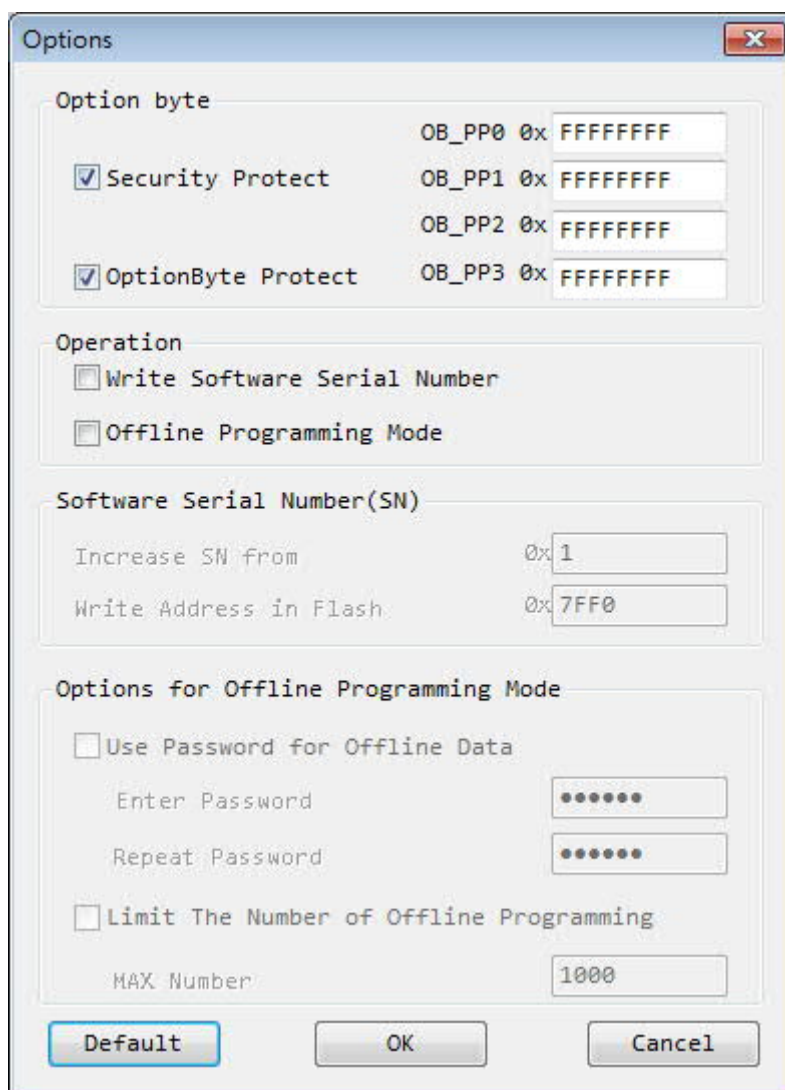
3. How to Use ICP Programming Tool

The main interface is shown below;



ICP Tool User Interface

The options interface is shown below;.



The screenshot shows the 'Options' dialog box with the following settings:

- Option byte**
 - ☒ Security Protect
 - ☒ OptionByte Protect
 - OB_PP0 0x FFFFFFFF
 - OB_PP1 0x FFFFFFFF
 - OB_PP2 0x FFFFFFFF
 - OB_PP3 0x FFFFFFFF
- Operation**
 - ☐ Write Software Serial Number
 - ☐ Offline Programming Mode
- Software Serial Number(SN)**
 - Increase SN from 0x 1
 - Write Address in Flash 0x 7FF0
- Options for Offline Programming Mode**
 - ☐ Use Password for Offline Data
 - Enter Password: [password field]
 - Repeat Password: [password field]
 - ☐ Limit The Number of Offline Programming
 - MAX Number: 1000

Buttons at the bottom: Default, OK, Cancel.

ICP Tool programming options Interface

The Erase interface is shown below;.



The screenshot shows the 'Erase MCU or Offline Flash' dialog box with the following elements:

- HT32 ICP TOOL V0.20
- www.holtek.com.cn
- Buttons: Erase MCU, Erase Offline Flash, Check update...

ICP Tool Erase Interface

The steps of read operation:

- A. Run the ICP Tool and connect to a e-Link32 to the PC.
- B. Select the correct target chip type, if you want to read the target chip
- C. Click the “Read” button and waiting for it to end

The steps of write to chip operation:

- A. Run the ICP Tool and connect to a e-Link32 to the PC.
- B. Select the correct target chip type
- C. Select the object file(.bin or .hex)
- D. Open “Options” interface, make sure “Offline Programming Mode” is NOT checked
- E. Click the “Start” button and waiting for it to end

The steps of write to offline flash operation:

- A. Run the ICP Tool and connect to a e-Link32 to the PC.
- B. Select the correct target chip type
- C. Select the object file(.bin or .hex)
- D. Open “Options” interface, make sure “Offline Programming Mode” is checked
- E. Click the “Start” button and waiting for it to end

NOW, you can programming chip with e-Link32 alone.

Press the button on the e-link32 board;

Should see the orange-LED on immediately;

Waiting for the orange-LED blink:

if the orange-LED and the green-LED blink 3 times and then off, it means programming successful;

if the orange-LED blink alone and continue many times, it means fail.

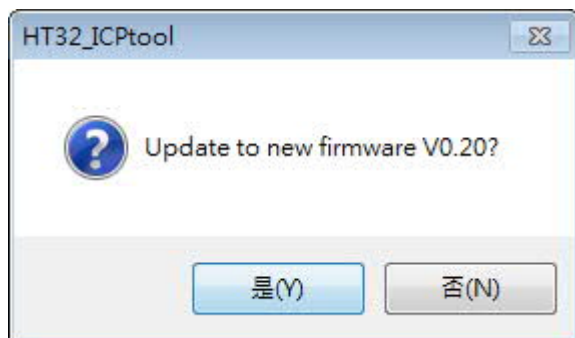
Notice: if there is not SPI flash on the e-Link32, the function of offline programming is reserved

4. e-Link32 Firmware Update

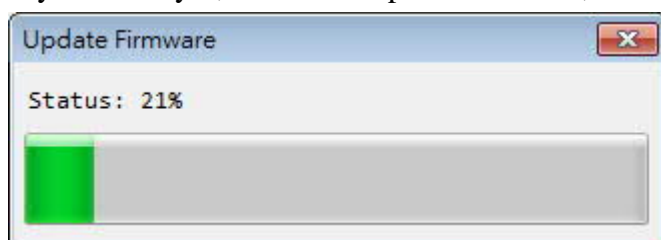
Run the ICP Tool and connect to a e-Link32 to the PC.

Process any read or write operation;

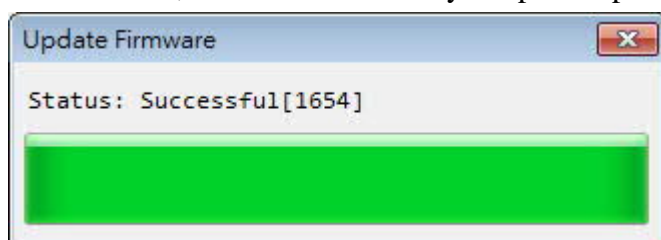
If the firmware version is older than ICP Tool, a firmware update form will be displayed, as shown below.



If you select yes, it will start update firmware, as shown below.



After a while, the status will show you update operation is complete.



Notice: Do not stop it when updating firmware, Otherwise it will always be in the IAP mode.

Revision History

Revision	Date	Description
0.04	2016-03-23	The first Public release version
0.05	2016-03-25	ICP Tool adds support for multiple e-Link32 when connected
0.06	2016-04-05	Fix VCOM bug
0.07	2016-04-12	Fix read option page bug
0.09	2016-05-26	F/W compatible with e-Link32 pro; fix SN not 0xffffffff bug
0.10	2016-06-02	Fix UART interrupt bug; add WDT
0.11	2016-06-14	When update Firmware, write version and SP at the end
0.12	2016/7/28	Fix VCOM descriptor
0.13	2016/9/28	Fix 1253 MDID error
0.14	2016/10/24	Fix offline WDT timeout bug
0.15	2016/12/15	1,Add interface string; 2,Support 52341 F/W update
0.16	2017/4/7	1,兼容某些串口软件打开端口的差异; 2,烧录时加入 CRC0; 3,修正 boot pin 拉低时脱机烧录出错; 4,界面加入最小化;
0.17	2017/5/2	1,增加 BKISO; 2,优化程序, SWD 提速, 脱机烧录提速; 52341 版本 elink32 烧录 127K 52352 从原 7.1s 减至 2.6s; 1654 版本 elink32 烧录 127K 52352 从原 2.1s 减至 1.7s。
0.18	2017/12/14	1,增加 HT32F0008, HT32F5826 等型号; 2,修正对 52341 主芯片的 elink32 更新偶尔会失败的 bug; 3,UI 更新;
0.19	2017/12/18	1,修正更新 elink32 F/W 之后立刻写 target, 数据是被覆盖的错误数据 bug;
0.20	2017/12/21	1,修正脱机烧录时, 因 Reset 脚未连接, WDT 有可能会复位的 bug;
0.21	2018/01/24	1,修正目标芯片 SWD 切换到 GPIO,并且时钟源为 HSI 时会无法操作的 bug;
0.22	2018/03/09	1, 增加 CRC16, 保持与 HOPE3000 的结果一致; 去掉 AutoSelect 功能; 2, 修正新引入的 offline 烧录 LED 状态 bug 和 RESET pin bug; 3, 增加每周自动检查一次线上新版本功能; 4, 修改读取操作之后自动跳转到 MCU Flash 页面; 5, 增加芯片型号 HT32F0006;
0.23	2018/11/20	1, 增加 52344、52354; 2, 修改 uart 的波特率配置, 最高可到 3Mbps; 3, Software 与 firmware 版本不一致就提示更新 firmware。
0.24	2019/04/08	1, Delete auto check update;

Revision	Date	Description
0.25	2019/08/28	1, 修正虚拟串口的相关 bug: 打开串口的定义和 UART 的中断优先级;
0.26	2019/09/19	1, 增加 57331, 57341 等 11 个新型号 MCU;移除几个太旧的型号; 2, Reset 改为 AutoDetect 模式: 除睡眠或 SWD 被切成 GPIO, 可不接 reset; 3, 可以拖拽文件到界面上来打开文件;
0.27	2019/10/31	1, 增加新型号 HT32F65230; 2, 修正打开超大文件会崩溃的 bug;
0.28	2019/11/14	1, 修改设置波特率的优先级, 防止打开串口后立即发送数据可能出现波特率错误。

Holtek Semiconductor Inc. (Headquarters)

No.3, Creation Rd. II, Science Park, Hsinchu, Taiwan
Tel: 886-3-563-1999
Fax: 886-3-563-1189
<http://www.holtek.com.tw>

Holtek Semiconductor Inc. (Taipei Sales Office)

4F-2, No. 3-2, YuanQu St., Nankang Software Park, Taipei 115, Taiwan
Tel: 886-2-2655-7070
Fax: 886-2-2655-7373
Fax: 886-2-2655-7383 (International sales hotline)

Holtek Semiconductor (China) Inc.

Building No.10, Xinzhu Court, (No.1 Headquarters), 4 Cuizhu Road, Songshan Lake, Dongguan, China 523808
Tel: 86-769-2626-1300
Fax: 86-769-2626-1311

Holtek Semiconductor (USA), Inc. (North America Sales Office)

46729 Fremont Blvd., Fremont, CA 94538, USA
Tel: 1-510-252-9880
Fax: 1-510-252-9885
<http://www.holtek.com>

Copyright © 2013 by HOLTEK SEMICONDUCTOR INC.

The information appearing in this Data Sheet is believed to be accurate at the time of publication. However, Holtek assumes no responsibility arising from the use of the specifications described. The applications mentioned herein are used solely for the purpose of illustration and Holtek makes no warranty or representation that such applications will be suitable without further modification, nor recommends the use of its products for application that may present a risk to human life due to malfunction or otherwise. Holtek's products are not authorized for use as critical components in life support devices or systems. Holtek reserves the right to alter its products without prior notification. For the most up-to-date information, please visit our web site at <http://www.holtek.com>